Unit 7 - Lesson 5
Overriding Methods

Computer Science A

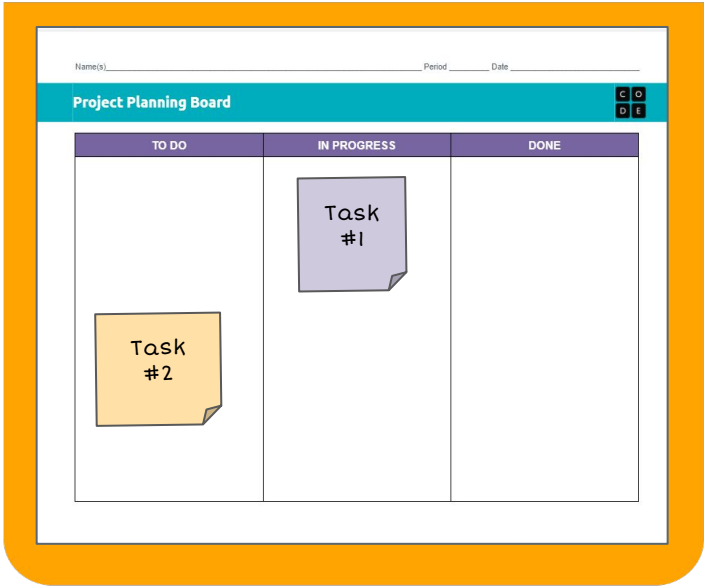
🎯 Benchmark #1: Due Lesson 6

- Brainstorm project ideas and goals
- Decompose the problem to identify the classes and methods you will need to implement
- Obtain and implement feedback from peers

✅ Do This:

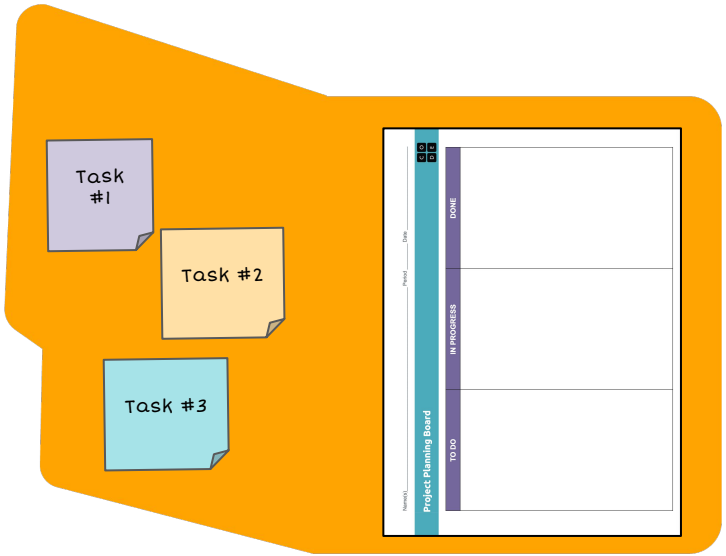
Move the task you will work on to the **IN PROGRESS** column of your Project Planning Board.

Work on your Creative Coding in The Theater Project.



✅ Do This:

Update your **Project Planning Board** and **Project Backlog** with any tasks you completed, changed, or added.



🚀 Question of the Day

How can I override methods from other classes?

Overriding a method occurs when a method in a **subclass** is defined with the **same method signature** as a method **inherited** from its **superclass**.

toString

`public String toString()`

The `toString()` method returns a `String` representation of an object.

Note: This method is often overridden.

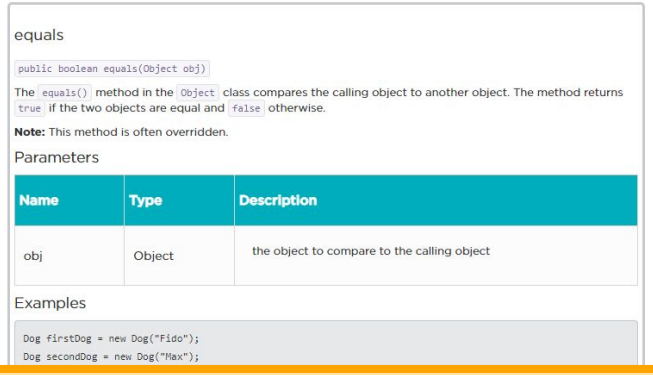
Examples

```
Object obj1 = new Object();
System.out.println(obj1.toString());
```

Output:

java.lang.Object@7a81197d

We override the **`toString()`** method from the **`Object`** class to create and return a **`String`** containing object information.



equals

`public boolean equals(Object obj)`

The `equals()` method in the `Object` class compares the calling object to another object. The method returns `true` if the two objects are equal and `false` otherwise.

Note: This method is often overridden.

Parameters

Name	Type	Description
obj	Object	the object to compare to the calling object

Examples

```
Dog firstDog = new Dog("Fido");
Dog secondDog = new Dog("Max");
```

We override the **`equals()`** method from the **`Object`** class to compare two objects.

Retrieve
your knowledge and ideas and write it down silently

Pair
up with a neighbor and talk about your reflections

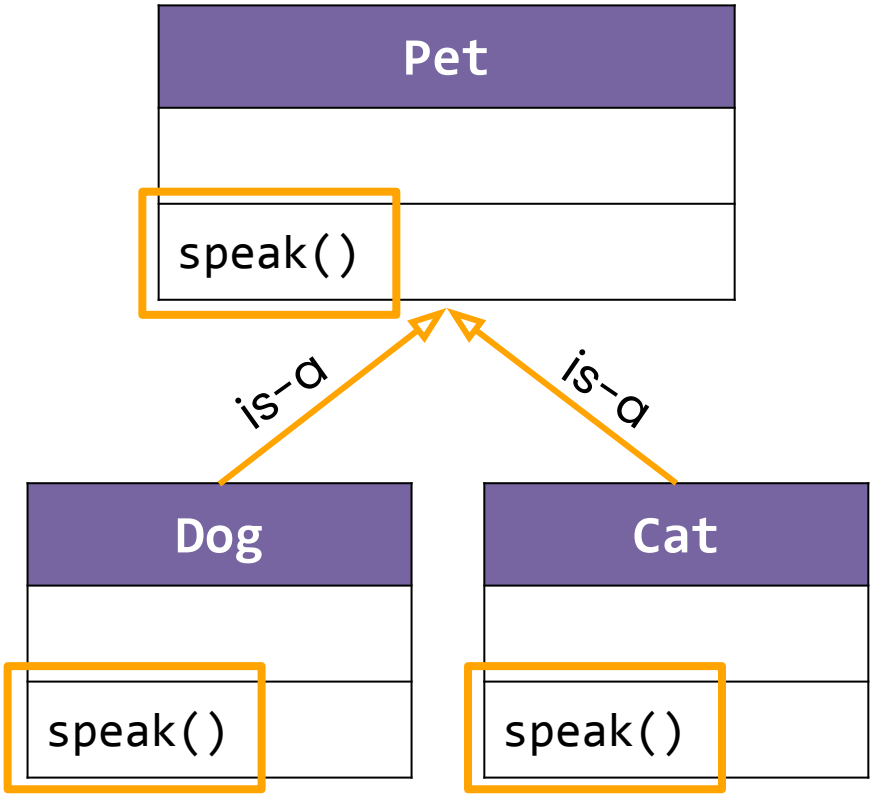
Share
your thoughts in a class discussion

Discuss:

- Why would we want to override methods written in a class?
- Where else have we seen the benefits of overriding methods?

Polymorphism is where the same object or method has more than one form.

This **`speak()`** method behaves differently for each type of **`Animal`**.



Rules for Overriding Methods

- Only **inherited methods** can be overridden.
- Static methods **cannot** be overridden.
- The overriding method **must** have the **same argument list**.
- The overriding method **must** have the **same return type**.

MySuperclass.java

```
public int calcSum(int a, int b) {

    . . .

}
```

MySubclass.java

```
public int calcSum(int a, int b) {

    . . .

}
```

```
public class Animal {

    . . .

    public void speak() {
        System.out.println("Animal sound.");
    }
}
```

The **super** keyword can be used to call a superclass method in a subclass method.

```
Animal puppy = new Dog();
puppy.speak();
```

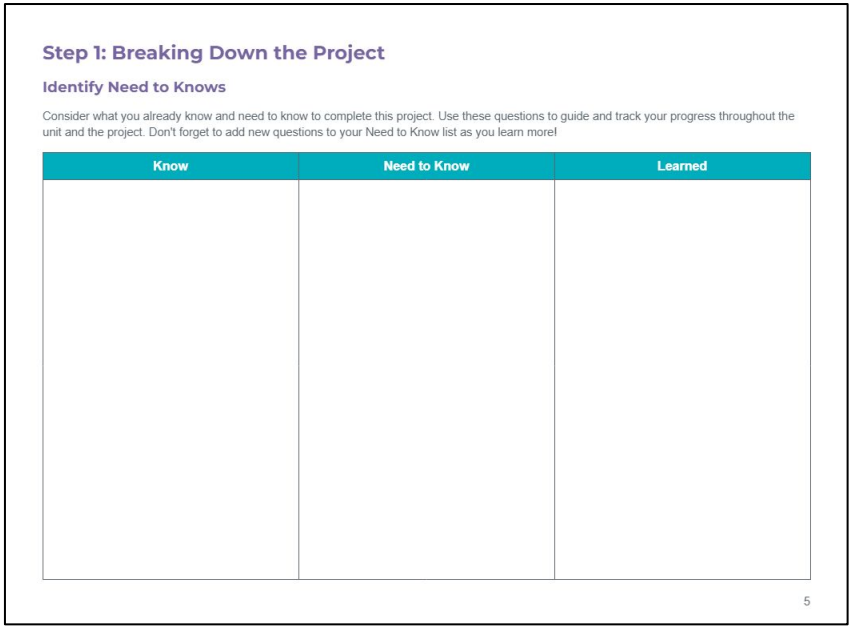
```
Animal sound.
Woof!
> _
```

```
public class Cat extends Animal {

    . . .

    public void speak() {
        super.speak();
        System.out.println("Meow!");
    }
}
```

✅ Do This:

Revisit your **Need to Knows**!

- Check off **answered questions** in the **Need to Know** column.
- Add what you have **learned** and **answers to any questions** in the **Learned** column
- Add any **new questions** to the **Need to Know** column



Step 1: Breaking Down the Project

Identify Need to Knows

Consider what you already know and need to know to complete this project. Use these questions to guide and track your progress throughout the unit and the project. Don't forget to add new questions to your Need to Know list as you learn more!

Know	Need to Know	Learned

5

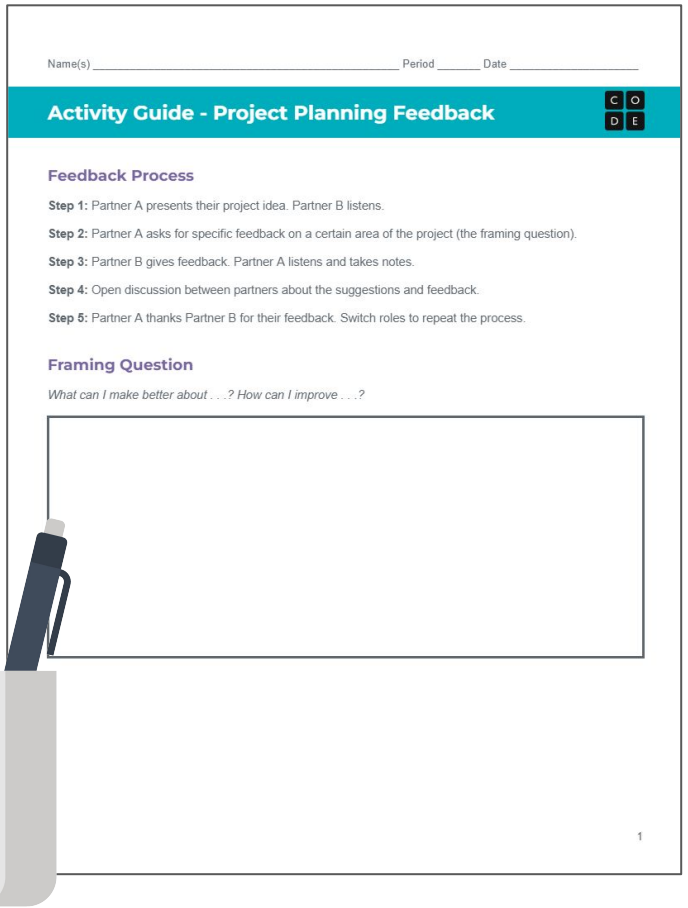
Unit 7 - Lesson 6
Intellectual Property

Computer Science A

Project Planning Feedback

📍 **You and your partner should have:**

- Project Planning Feedback handout
- pen / pencil



Name(s) _____ Period _____ Date _____

Activity Guide - Project Planning Feedback

Feedback Process

Step 1: Partner A presents their project idea. Partner B listens.

Step 2: Partner A asks for specific feedback on a certain area of the project (the framing question).

Step 3: Partner B gives feedback. Partner A listens and takes notes.

Step 4: Open discussion between partners about the suggestions and feedback.

Step 5: Partner A thanks Partner B for their feedback. Switch roles to repeat the process.

Framing Question

What can I make better about . . .? How can I improve . . .?

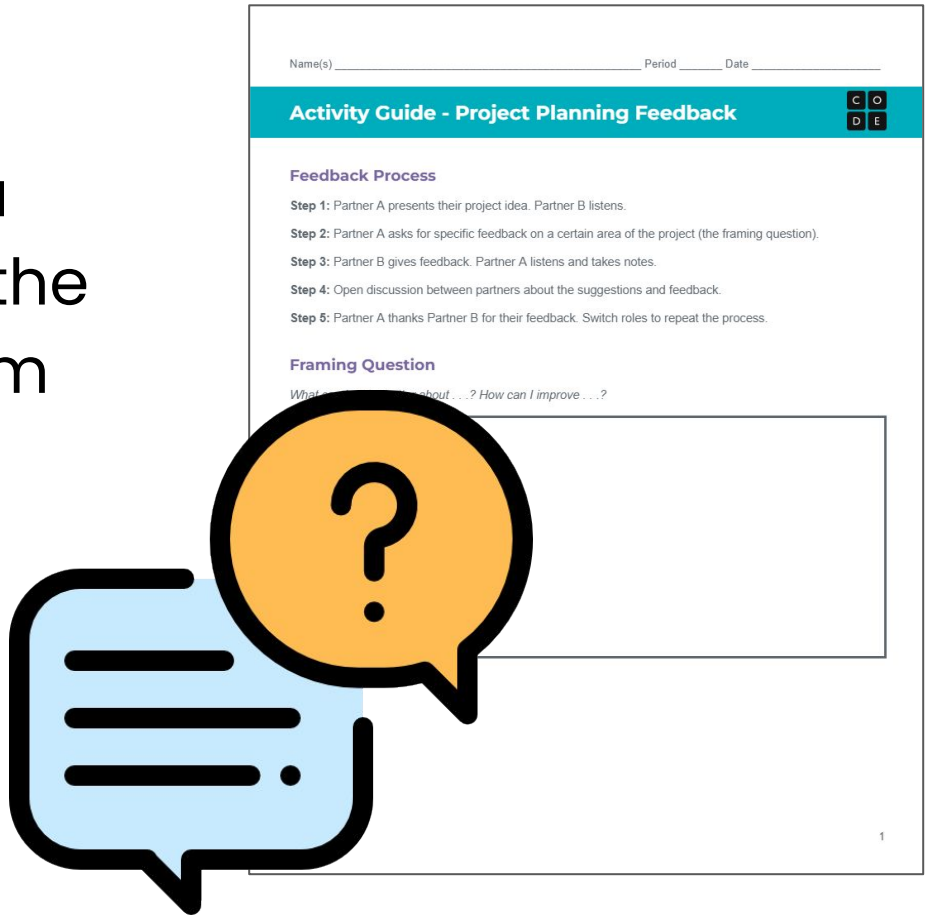
1

Feedback Process

- **Step 1:** **Partner A** presents their project idea. **Partner B** listens.
- **Step 2:** **Partner A** asks for specific feedback on a certain area of the project (the framing question).
- **Step 3:** **Partner B** gives feedback. **Partner A** listens and takes notes.
- **Step 4:** Open discussion between partners about the suggestions and feedback.
- **Step 5:** **Partner A** thanks **Partner B** for their feedback. Switch roles to repeat the process.

✅ Do This:

Write a **question** that you want answered to guide the feedback you receive from your partner.



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Framing Question

What . . . about . . . ? How can I improve . . . ?

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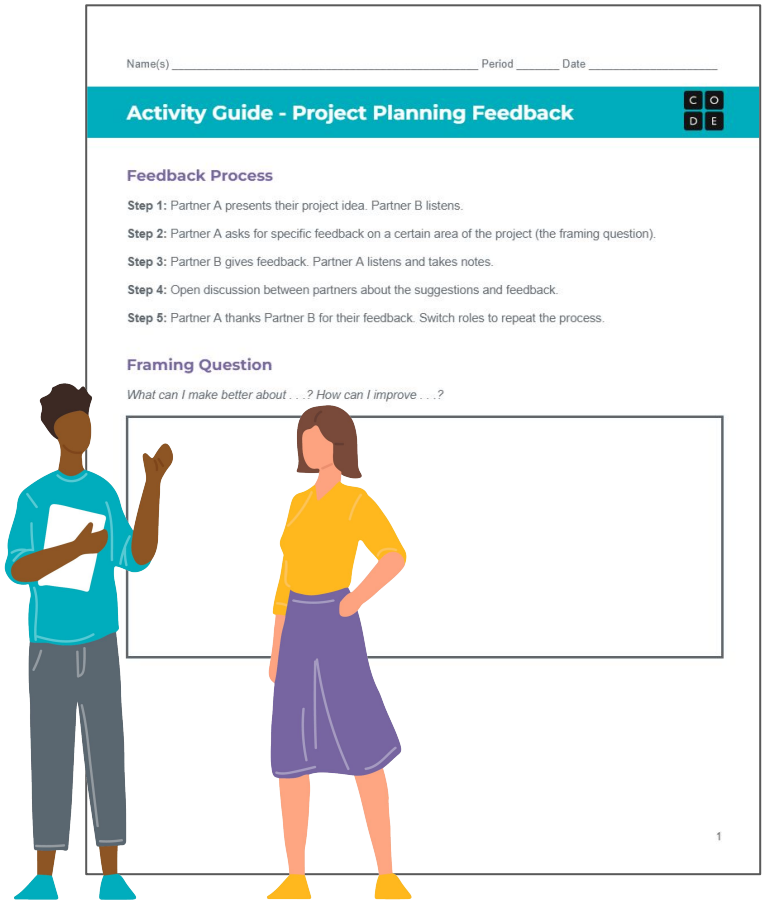
✅ Do This:

Ask your partner your framing question and share feedback.

Take notes on your Project Planning Feedback handout.



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Framing Question

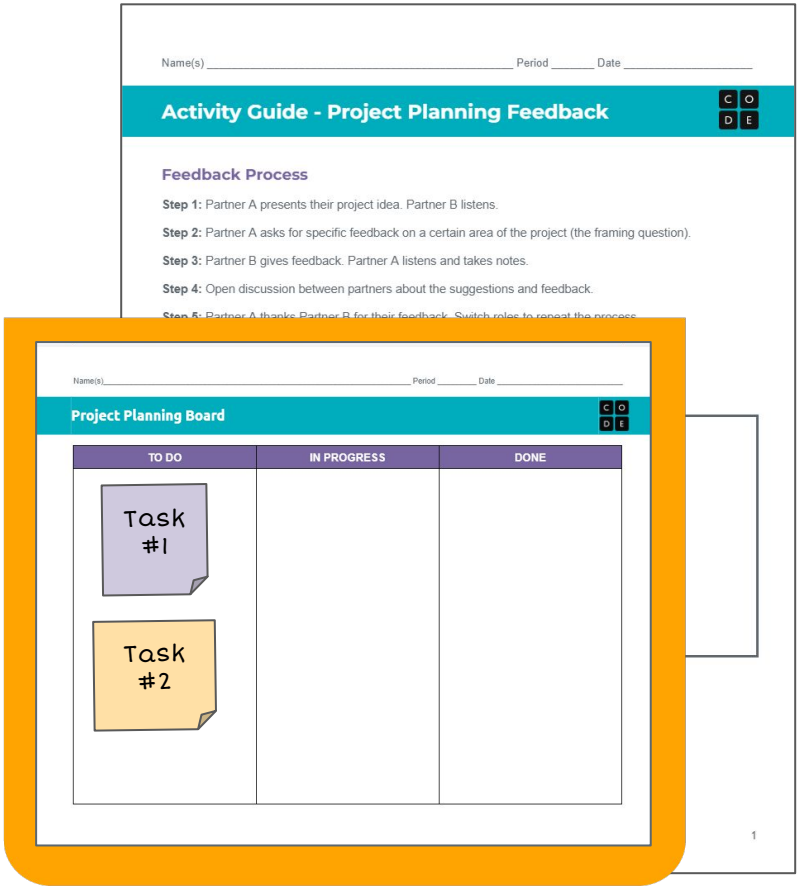
What can I make better about . . .? How can I improve . . .?

1

✅ Do This:

Respond to the prompt on your Project Planning Feedback handout.

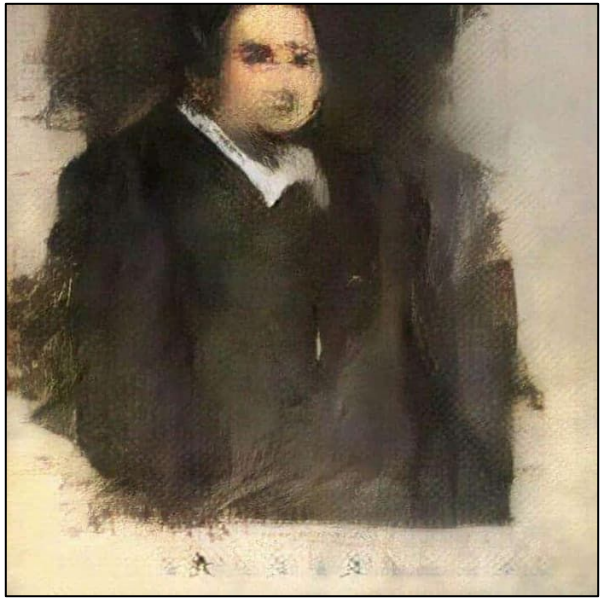
Post the tasks for the second benchmark in the **TO DO** column of your Project Planning Board.



🚀 Question of the Day

Are AI-generated images art?

In 2018, the painting entitled *Portrait of Edmond Belamy* became the first-ever piece created by AI to be sold at a major auction.



In 2022, Jason Allen won first place in the digital art category at the Colorado State Fair using an image created by Midjourney's AI.

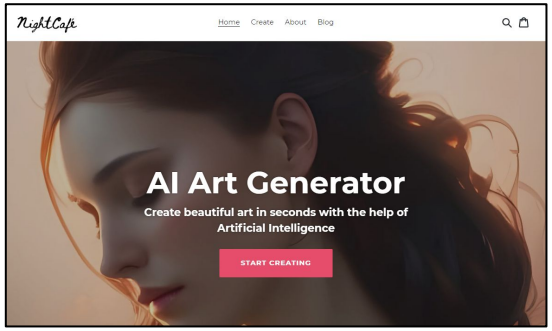
Retrieve
your knowledge and ideas and write it down silently

Pair
up with a neighbor and talk about your reflections

Share
your thoughts in a class discussion

💡 Discuss:

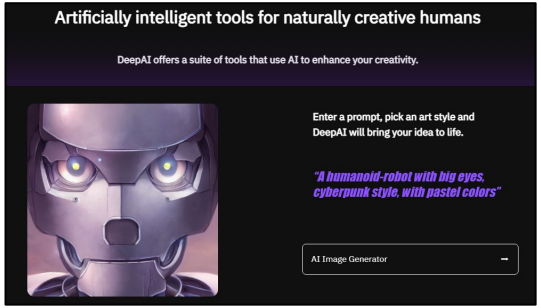
What does this make you **wonder** or **feel**?

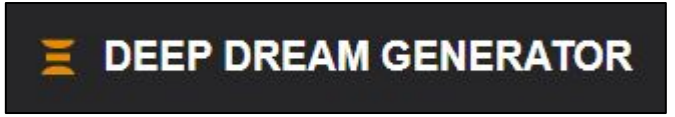


NightCafe is known for having more algorithms and options than other AI painting generators.

Midjourney generates images from natural language descriptions.

DeepAI is one of the first AI painting generators to enable the generation of AI images through open source software.





Deep Dream Generator requires you to upload an image and then automatically generates a new image based on the original.

These AI programs are fed **pre-existing** images and art.

For example, **Stable Diffusion** was trained using **LAION-5B**, which is a dataset that includes over **5 billion** publicly available images.

💡 Discuss:

Should we consider AI-generated images art?

Intellectual property is the **legal ownership** of an individual or company's **creations of the mind**, such as inventions, literary and artistic works, designs, symbols, names, and images.

✅ **Do This:** Complete the following statements on your sticky note or scrap piece of paper:

- AI generated images make it possible for everyone to create art **but** _____.
- AI generated images make it possible for everyone to create art **because** _____.
- AI generated images make it possible for everyone to create art **so** _____.

💼 Key Vocabulary

- **intellectual property:** the legal ownership of an individual or company's creations of the mind, such as inventions, literary and artistic works, designs, symbols, names, and images